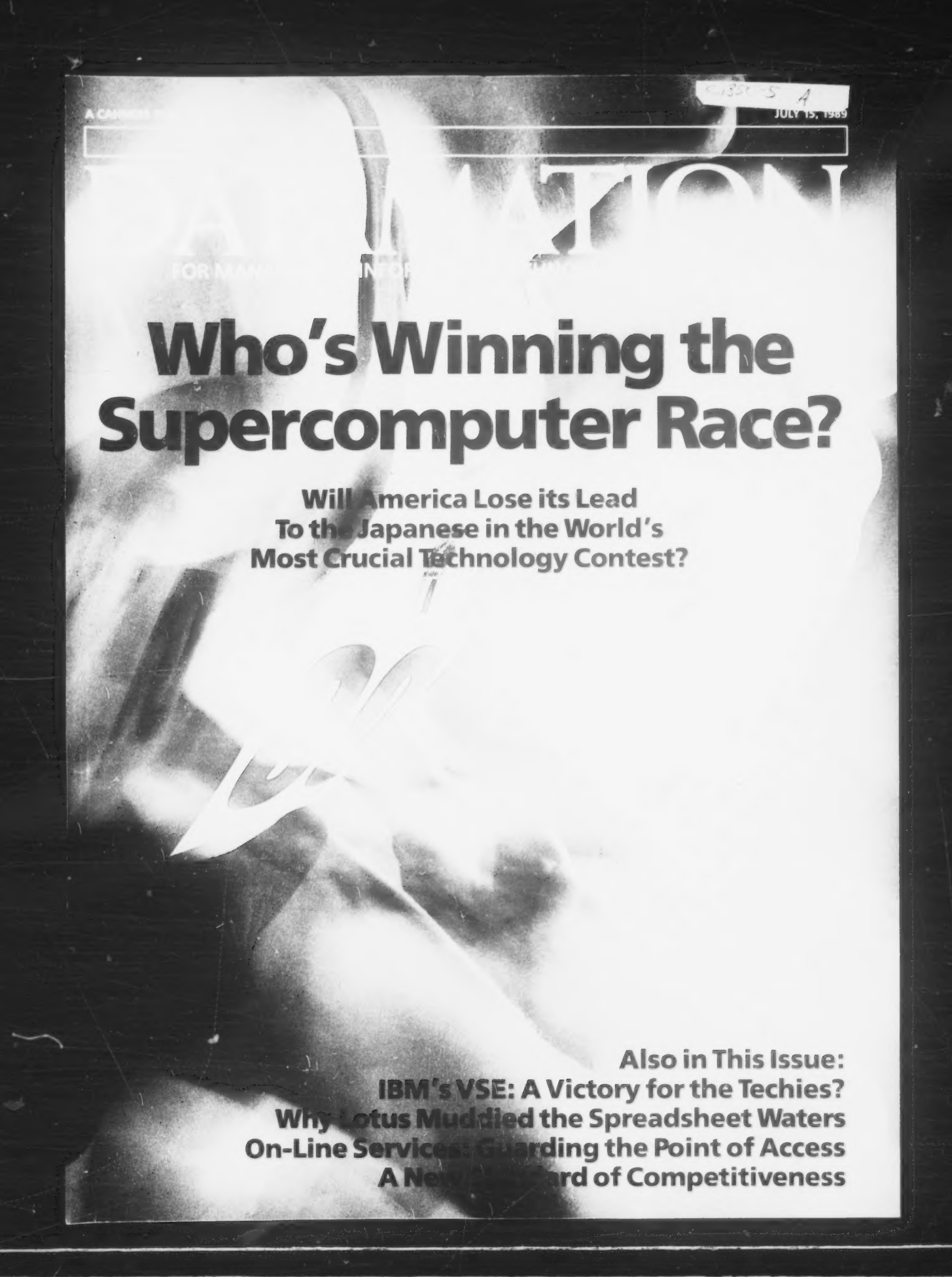

Who's Winning the Supercomputer Race?

Will America Lose its Lead To the Japanese in the World's Most Crucial Technology Contest?

Also in This Issue:

IBM's VSE: A Victory for the Techies?

Why Lotus Muddied the Spreadsheet Waters

On-Line Services: Guarding the Point of Access

A New Standard of Competitiveness

JULY 15, 1989

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DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

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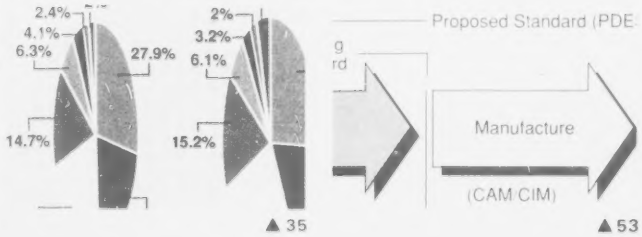
EDITED BY LINDA RUNYAN A report on products, services and methodologies for IS managers in government and financial services. Future editions will serve managers in the manufacturing sector. (Not included in all issues.)



What's the Supercomputer Race About?

From all the talk and press coverage, one might surmise that the U.S. supercomputer industry is on the endangered species list. After all, the acknowledged industry leader, Cray Research Inc., is undergoing significant change. The company has transferred founder Seymour Cray to a new spinoff, Cray Computer Corp., to continue the expensive development of a supercomputer based on risky gallium arsenide technology. Meanwhile, Control Data Corp. terminated its ETA Systems supercomputer subsidiary altogether. And it seems that Tokyo-based NEC Corp.'s machines may have surpassed Cray's in computing speeds. All of these events could be construed as a rather dark picture of a leading American industry.

The predator in this case is, of course, the fearsome Japanese computer industry—in particular NEC, Fujitsu Ltd. and Hitachi Ltd. Mindful of the fact that the Japanese have dealt a deadly blow to the U.S. semiconductor industry in the area of memory chips, observers of recent events in the U.S. supercomputer industry have been given to much handwringing. Will the Japanese companies, with their longer term view and government support, be able to surpass the U.S. supercomputer industry technologically, thereby placing the U.S. military establishment and the IS industry in position of dependency on a foreign supplier? With Seymour Cray's new company not yet off the ground, and an IBM-backed start-up, Supercomputer Systems Inc., yet to produce its first product, the U.S. supercomputer industry is effectively down to one company. What will happen to the U.S. position in supercomputers now?

Photograph by M.C. Velada

POUNDING THE HIGH-PERFORMANCE computing beat is one of Schatz's chief pursuits.

There is little question about the formidable nature of the Japanese computer companies. They are large, well financed and motivated to succeed in all levels of the computer and electronics industries. But as our cover story, "Who's Winning the Supercomputer Race?" page 18, reveals, the technological facts may tell something of a different story when it comes to supercomputers. "A hard look at a technological scorecard shows that handwringing is probably justified in the areas of base technology and raw computing power," writes Washington bureau manager Willie Schatz. ". . . But in the critical areas of systems and applications software, sighs of woe may be a bit premature."

The Other End of the Spectrum

The role that Lotus Development Corp.'s 1-2-3 spreadsheet played in rocketing the personal computer to fame and fortune has become almost the stuff of legend. But now users are facing a difficult choice, says Dallas bureau manager Bob Francis. Should they migrate to the thrice-delayed release 3.0 or go to the less expensive, but only recently disclosed, release 2.2? Boot up "Muddy Waters," page 31, to help clarify your thinking.

Francis also zeros in on a new challenge facing IS managers. That challenge is the Product Data Exchange Specification, a method of digital product definition that is being touted as a replacement for the Initial Graphics Exchange Specification used in engineering and manufacturing. Changes in the way design, engineering and manufacturing information will be handled could be coming. Access "Competitiveness: A New Standard," page 53, to find out how you should handle those changes.

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DATAMATION

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Who's Winning the Supercomputer Race?

Cray Research's current problems, the demise of ETA Systems and the advancements in Japanese technology seem to spell doom and gloom for the U.S. supercomputer industry. But technologically, the race may not be over yet.

BY WILLIE SCHATZ

In some quarters, the handwringing has been: Cray Research Inc., the world's foremost supercomputer maker, faltered, then split in two. Control Data Corp.'s anemic ETA Systems subsidiary expired, leaving the industry and the United States at large with only the divided Cray and an IBM-backed start-up, Supercomputer Systems Inc., that is still several years away from producing its first machine. The Japanese, meanwhile, forge ahead with ever faster supercomputers.

Could it be that the United States, the world's leader in computer technology, is losing its edge in supercomputers, perhaps strategically the most important class of computers? Could U.S. industry, particularly in its research and development efforts, be hurt as a result?

A hard look at a technological scorecard shows that handwringing is probably justified in the areas of base technology and raw computing power, if the Japanese are able to deliver the performance in their next generation of systems. But in the critical areas of systems and applications software, sighs of woe may be a bit premature.

Furthermore, installation figures show considerable strength for Cray. Cray has sold 16 supercomputers in Japan, 13 of which have been installed. To date, only three Japanese supercomputers have made it into the United States—an NEC Corp. SX-2, installed at the Houston Area Research Center, and two Fujitsu Ltd. VP-100s installed at the U.S. headquarters of the Norwegian oil company, Geophysical Co.

The Japanese Edge

In terms of base technology, the Japanese seem to be in the lead. First, U.S. companies have become

dependent on Japanese component suppliers. For example, Cray employs Fujitsu memory chips in its current generation X-MP and Y-MP supercomputers. Second, in terms of architecture, NEC's SX-X's silicon pipeline construction, which enables the machine to operate in parallel, beats the Y-MP's silicon vector arrangement, which does not allow for parallel processing.

In the important category of speed, the Japanese also seem to be in the lead, especially when the specifications for the coming generation of products are examined. NEC's eight-model SX-X family will first be available in the third quarter of 1990. The highest-end SX-X44 supercomputer is expected to perform, theoretically at least, at 22 billion floating point operations per second. This compares with only 2.86 GFLOPS for Cray's current top-of-the-line Y-MP and an expected 16 GFLOPS for both the C-90 and Cray-3, due out next year.

"If performance is all that matters, I'd choose the SX-X over the Y-MP," concludes Peter Patton, director of technology assessment for the Supercomputer Performance Computing Service of the San Jose-based market research company Dataquest Inc. "For starters, it's got a clock speed more than twice as fast [as Cray's machine]. . . . Taking what's out there now, the SX-X is the most powerful machine that is deliverable the soonest." The SX-X will be marketed in the United States by the Honeywell-NEC joint venture HNSX Supercomputers Inc. of Burlington, Mass.

Cray probably wins in the software arena, but, in terms of operating systems, the lead may not last for long. Cray first came to market with a version of the UNIX operating system, UNICOS, in 1985, but NEC's HNSX may not be far behind. HNSX will make UNIX version 5.3 with 4.3 Berkeley extensions available on its first U.S. machine.

UNIX Is Key

Still, at present Cray has a head start in the form of its installed user base. Of the 220 Cray supercomputers installed in the world, 70 run UNICOS—but 120 run the proprietary Cray Operating System (COS) and 30 run the proprietary Cray Time-Sharing System (CTSS), an indication that there is much room in Cray's user base for migration to UNICOS. And currently, the three Japanese suppliers—NEC, Fujitsu and Hitachi—offer only proprietary operating systems.

And Cray may be able to capitalize further on its

Chart illustration: Chuck Mackey

initial UNIX advantage, depending on what enhancements NEC incorporates with its UNIX offering. "If NEC brings up pure UNIX [a basic version without extensions], it's going to be a problem for people who run supercomputer centers," says Chuck Fox, assistant director of the San Diego Supercomputer Center (SDSC), citing accounting and job management problems with pure UNIX.

U.CAL.'S SUGAR says the Japanese must follow the UNIX route in the U.S.

For some users, any version of UNIX is a good version. "U.S. companies are going to UNIX rapidly, and I think the Japanese have to do the same," adds Robert Sugar, professor of physics at the University of California in Santa Barbara. "It's going to be a great day for me as a user if everyone settles on one operating system. And I don't care which one it is."

The vendors probably don't either. Having achieved considerable penetration of its user base with UNIX, Cray isn't about to stop now. That means HNSX doesn't have much choice if it's ever going to hit a U.S. home run. So the company's running native UNIX on an NEC SX-2 in Tokyo and is planning to port it to the SX-X on an arithmetic processor. HNSX is also using the SX-2 to develop UNIX extensions.

Providing the right operating system doesn't mean clearing the applications hurdle, though. Cray seems way ahead in this area, although Dataquest's Patton is not sure that strength in applications is necessarily money in the bank for Cray.

If the technological issues are complex, the political ones are downright Byzantine. The only U.S. entity barred by law from buying a Japanese supercomputer is the Department of Defense, which must purchase only U.S.-made supercomputers. But that law might as well list every other potential U.S. customer because none has violated a de facto boycott of Japanese machines.

The Political Freeze

The technological implications of such a freeze out of Japanese machines are uncertain, but some feel that users will be put at a disadvantage eventually. "To the extent that we're not importing technology from Japan—such as the Hitachi S-820 line of air-cooled supercomputers, which the U.S. doesn't have—it is to our eventual disadvantage," says Sid Karin, director of the SDSC.

So what's the United States doing about it? Not much. At press time, Japan was among the countries targeted for a "Super 301" trade sanction, the maximum penalty under the 1988 Omnibus Trade and Competitiveness Act. Having lost large chunks of the memory chip market to the Japanese, the United States isn't anxious for a supercomputer sequel, particularly as supercomputers are not only important as a market in themselves but as the means to developing other technologies and products. "It's not a good position to be dependent on your competition for real value added or product differentiation . . . something fundamental to what your customers are trying to accomplish," warned CDC chairman Robert Price at a press conference the day after ETA died.

Despite such protectionist concerns, there is some evidence that the supercomputer political climate

Supercomputer Developments in the Soviet Union

While much of the world focuses on the supercomputer competition between Japan and the United States, developments in supercomputers and related architectures are going on in other countries. And some of the most potentially significant ones, particularly in the space exploration and defense realms, are occurring in the Soviet Union.

When the Soviet space shuttle Buran lifted off last November, an Elbrus-2 supercomputer was used to manage and control the mission. Although not in the Cray class, the Elbrus-2 is just one of 10 major supercomputer developments in the Soviet Union, DATAMATION has learned.

The 10 projects are:

- Continuing research into the Elbrus family of computers at Lebedev Institute in Moscow;
- Research into Cray 1-class supercomputers at the Institute for Cybernetics Problems in Moscow;
- Development of the PS2000 and 3000 vector processors at the Control Problem Institute in Moscow;
- Work on parallel-processing at Moscow State University;
- Research into macro-pipelining architectures at the Institute of Cybernetics in Kiev;
- Development of the MARS-M supermini in Novosibirsk;
- Development of the ES2703 fine grain parallel processor at Radio Engineering Institute of Taganrog in the Ukraine;
- Development of the ES2704 fine grain parallel system at the Informatics Institute in Leningrad;
- Study of array processors, superminis and shared memory techniques, in cooperation with Bulgaria.
- Research into fault tolerant computers, thought to be continuing at the Spaceflight Control Center in Moscow.

While the West is heavily into GFLOPS, the Soviets are just starting to creep into the upper hundreds of MFLOPS. The Soviets have some basic technology problems, particularly in chip technology, that they acknowledge but are working to improve.

Soviet President Mikhail S. Gorbachev's chief scientific adviser, Soviet Academy of Sciences vice president Yevgeny Velikhov, told DATAMATION that the Soviet IS lags behind the West in its ability to mass produce very large scale integration (VLSI) processor and memory chips in the quantities needed to achieve volume production targets.

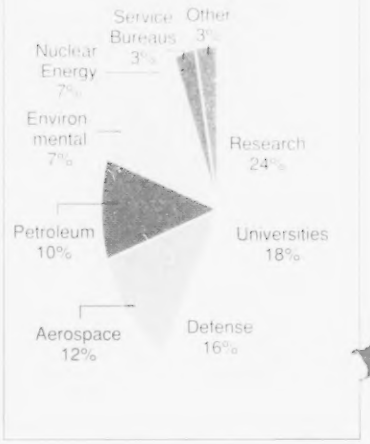
But Velikhov refuses to concede that the Soviet IS industry is dependent on the West and claims that the technology trade embargoes of the Reagan era have merely driven his country toward greater self-sufficiency.

And they are moving ahead, given the current number of Soviet projects and the Soviets' considerable technological advances since they reduced their reliance on a serviceable but obsolete class of supercomputer called the BESM-6. This ma-

Photograph by Rick Browne

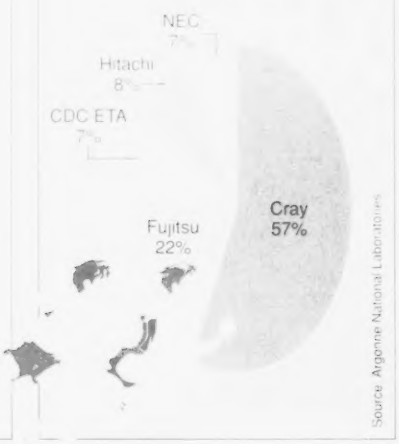
Where Supercomputers Are Used Worldwide

Research institutions are by far the biggest users of supercomputers



Not Surprisingly, Cray Is the Market Leader

But combined market share for the Japanese adds up to 37%



Source: Argonne National Laboratories

may be warming slightly. "There's been a lot of discussion about it [the wisdom of keeping out the high-end SX-X44]," says Bob Borchers, associate director for computation at Lawrence Livermore National Laboratory, which has been prevented from obtaining a Japanese machine by the Department of Energy's de facto boycott. That policy is currently under review pursuant to the DOE's commitment to conducting open procurements for its supercomputers. The Japanese will find out next summer if the DOE means what it says when the agency releases its first procurement since the SX-X announcement.

"I'm urging DOE to face the issue up front," says Borchers. "I don't want to have HNSX win the contract and then sit for two years while politics holds things up.

Adds Karin: "The industries that use supercomputers are far more important than [the issue of] who builds the machines. . . . How important it is to have a domestic supplier is open to debate."

Cray Against the World

Meanwhile, the debate about the health of the domestic industry also continues. ETA's death removes one competitor from the supercomputer scene. A prospective competitor on the horizon is IBM, which has invested in Supercomputer Systems Inc. of Eau Claire, Wis., started by former Cray designer Steve Chen in 1988. SSI, however, is not expected to roll out a machine until 1993.

That leaves Cray, which is having both financial and technical troubles. Cray reported a 94% decrease in first-quarter revenues, producing an operating loss of $1 million. On the technical side, problems with the gallium arsenide chips that will power the Cray-3 have delayed its release by about a year. The Cray-3 is now being developed by Cray Research's founder, Seymour Cray, at the company that was split off from Cray Research—Cray Computer Corp. of Colorado Springs, Colo. The Cray-3 is now expected sometime in 1990. Cray Research's upcoming C-90, which relies on silicon-based chips, is also expected next year.

So, whether Cray is considered one company or two, it remains a de facto monopoly in the United States. But perhaps not for long. NEC may be planning to start manufacturing the SX-X family at Honeywell's plant in Phoenix. According to a knowledgeable source, such a move has already been presented by HNSX president Jim Berrett to the Energy Department if the DOE would agree to accept the first SX-X off the line.

While the conclusion of the supercomputer race may still be an open question, some observers see important implications in the fact that the race has become so close.

"How did supercomputers become equivalent to the snail darter?" asks Samuel Adams, vice president of marketing at HNSX. "Because U.S. companies lost their semiconductor lead, spent nothing on R&D and were satisfied with what they had. It got to the point where critical technology wasn't practical to manufacture in the U.S."

"This is like a relay race," adds Dataquest's Patton. "Japan's won the third leg. The U.S. is going to run awfully damn fast to catch up before the finish line."

chine is the computing backbone of the Soviet's successful manned spaceflight program.

In recognition of the throughput limitations of the BESM-6, development started in 1978 on a 10-multiprocessor system that would be able to offer up to 10MIPS, 10MB of main memory and a word length of 64 bits. Called the Elbrus-1, the computer encountered problems and never went into production. In 1984, the design was changed, and the machine was relaunched as the Elbrus-2. A fully configured Elbrus-2 cluster with vector processors can achieve around 200MFLOPS.

The Soviets loathe revealing production numbers, but DATAMATION's sources have learned that at least 10 Elbrus-2s, and possibly as many as 20, have been installed. One is at the Moscow Spaceflight Center, where it is currently managing the unmanned "Phobos" Mars probe. According to academician Oleg Belotserkovsky, director of the CAD Institute at the Academy of Sciences in Moscow, an Elbrus-3 will show up next year and an Elbrus-4 in 1995.

But the Soviets' most significant moves appear to be in the development of specialized processors and neural computing. Specialized processors, such as the PS2000/3000 and ES2706, can be plugged into a variety of host CPUs. Work on these parallel systems may prove to be the most fruitful of all Soviet developments. But until they cure their manufacturing and semiconductor ills, only the military and space sectors will benefit.

--By DATAMATION correspondents

Muddy Waters

A surprise for Lotus users—dual 1-2-3 upgrade paths—prompts many to revisit their migration strategy. The heretofore undisclosed release 2.2 casts some plans adrift.

BY BOB FRANCIS

Richard Wonnell feels like he's waist deep in Big Muddy as he ponders the new spreadsheet choices before him. As personal computer coordinator for VF Corp.'s Wrangler Division, Wonnell is one of many now reassessing his plans in the wake of Lotus Development Corp.'s decision to launch dual 1-2-3 spreadsheet upgrades.

Wonnell—like thousands of others who waited as Lotus twice delayed upgrades of 1-2-3—is no longer so certain of his company's spreadsheet course. Two upgrades—the long-awaited release 3.0 and a surprise addition, release 2.2—wasn't exactly what anyone had expected.

Wonnell and many other longtime Lotus users say that release 2.2 is the least costly upgrade, but it won't be generally available until September. So Wonnell at the Greensboro, N.C.-based jeans maker, which waited two years for the delayed 3.0 upgrade release, now waits to compare it with release 2.2, a version tailored to the smaller memory size of first-generation PCs. And, Wonnell is by no means alone. Many of the PC and IS managers who made 1-2-3 a virtual corporate standard are midstream in their spreadsheet plans.

"It's a complex and difficult decision," says Jeff Knepper, director of advanced technology at Touche Ross & Co.'s tax division in Washington, D.C. "Before [release 2.2 was announced], it was much simpler. Then, your choices were: stay put, change to release 3.0 or go to a third product. Now, you've got four choices. It makes the decision either very complex or very easy. If all you've got is [first-generation] 8088 machines, it's pretty easy. For those who don't, it's much more complex. Most of us are in that boat," he says.

The two 1-2-3 upgrades create separate versions appropriate to different PCs, depending on the nature of their microprocessors and graphics adapter support. Lotus is targeting release 3.0 for relatively newer PCs incorporating the Intel Corp. 80286, 80386 and 80486 microprocessors. Release 2.2, which contains some new ease-of-use features and other enhancements, accommodates the smaller memory size of first-generation PCs.

File Formats Differ

But, there are other considerations. Architecturally, release 2.2 is a direct successor to the widely used version 2.01 and is compatible with the hundreds of third-party add-in packages. In contrast, release 3.0 is written largely in the portable C language. Although compatible with the 2.01 version in terms of data and functions, release 3.0 includes a new file format that prevents it from being used with existing 1-2-3 add-in packages. However, the 3.0 version has an extensive set of application interfaces called the Lotus Add-In Toolkit (formerly known as Lotus Extended Application Facility). The toolkit lets spreadsheet, data base and other packages supporting the toolkit interfaces function as unified applications.

Such differences have muddied the waters for IS managers interested in upgrading immediately. "We're asking ourselves, What features will Lotus release 3.0 have? What will release 2.2 have? You can't really tell . . . until you put them to use, play with them and see what they do. So, right now, I'm simply waiting," Wrangler's Wonnell says.

Many larger companies are putting off the choice, agrees Mary Spark, a product manager for Corporate Software Inc., a Westwood, Mass., PC software distributor. "The evaluation cycle will be somewhat delayed for the need to look at both products at the same time," she says.

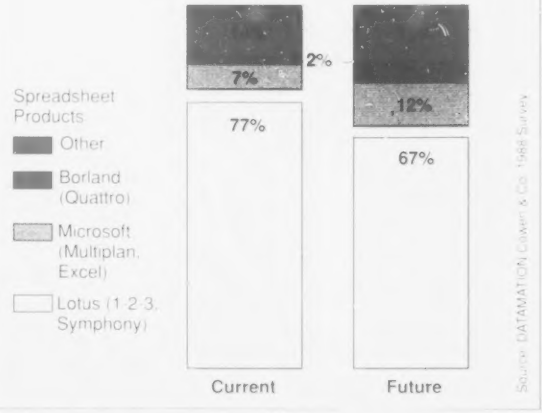
The question of add-in support and the hefty memory requirements of release 3.0 suggest that its appeal will be restrained—at least for the near future. Frank A. Ingari, Lotus vice president and general manager of the PC Spreadsheet Division, declines to comment on sales expectations for the two upgrades. However, he says: "We don't see [release] 2.2 as release 3 junior. . . . release 2 will live a long time. Those 6 million [first-generation PCs] won't go away." Furthermore, Ingari says, the new toolkit interfaces may not be permanently excluded from release 2.2. "There is the question of resource allocation," says the Lotus executive.

The parallel development of releases 2.2 and 3.0 suggests that separate upgrades may only be a temporary response to the heightened com-

In a Down Direction

Lotus 1-2-3's market share was expected to decline, according to a survey of DATAMATION readers conducted before the dual upgrade announcement.

% OF RESPONDENTS USING A PARTICULAR SPREADSHEET PRODUCT



Source: DATAMATION Culver & Co. 1988 Survey

petition surrounding 1-2-3. Although Microsoft Corp.'s Excel spreadsheet already offers fancy graphics, it also requires the more expensive, second-generation hardware. And, although Borland International Corp.'s Quattro runs on first-generation PCs, it does not offer the same sophisticated graphics of Excel or of 1-2-3 release 3.0.

OS/2 Is Behind Two Versions

Lotus hadn't initially planned on the dual upgrade. "Really, release 3.0 was first considered as an OS/2 product. When we saw that OS/2 was not going to take off as quickly as some ea[illegible] projections indicated, we began preparing it for a DOS platform, as well," says Chris Randles, senior product manager for 1-2-3. Still unclear is the ease of upgrading from release 2.2 to release 3.0. For instance, Lotus expects most add-in software developers to create separate versions for 3.0. Even so, Lotus has disclosed neither a policy nor pricing for upgrading its own add-ins from 2.2 to 3.0.

Lotus currently accounts for about 77% of all PC spreadsheet installations, according to the DATAMATION/Cowen & Co. 1988 Mini/Microcomputer Survey. However, that same survey projects a decline to a 67% share by the end of this year, while predicting that Microsoft's market share will rise from 7 to 12%, and Borland's share will triple from 2 to 6%, according to the summer 1988 survey of IS managers. (See "The Purchasing Outlook," November 15, 1988, p. 18.)

Yet, for those who abandoned 1-2-3 for other spreadsheet suppliers, it's not been all wine and roses. "We're in the process of changing our spreadsheet, or at least wanting to change our spreadsheet, but it's very difficult to discard that investment in Lotus 1-2-3," says Jake Parrott, end-user computing supervisor at Food Lion Inc. of Salisbury, N.C.

Food Lion recently designated Quattro as the corporate standard for PC spreadsheets. However, not all the company's users accept the change. "Some of the people in our analytical group are not happy with some parts of Quattro. It's like Lotus is a part of their PC, not just a software package," he says.

Still, Parrott says, Quattro does not force the company to make the hardware choices associated with release 3.0. "We run a pretty tight ship here. Even though we're adding PCs all the time, we're not going to have a wholesale move to 286 or 386 machines unless it's cost justified from A to Z," he says.

Hardware Upgrades Expensive

The issue of hardware upgrades isn't confined to Lotus, says Touche Ross' Knepper. "Excel would trigger a platform change . . . due to the graphics needed. So, just like [for] Lotus [release 3.0], the decision is not just a software issue. If you've got to buy a [Video Graphics Adapter] or [Enhanced Graphics Adapter] display, a mouse and get those working, it gets to be expensive, and it gets to be complex," he says.

"You're not just going out and buying a new piece of software anymore, you've got to commit to the right hardware as well, and that kicks it up into a whole different realm," says Knepper. From his perspective, the days of standing on the river banks are long gone. ▭

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Point of Access

Having gained control of their corporations' ubiquitous PCs, IS managers are now faced with a resulting boom in on-line data base services that itself is crying out for IS control.

BY LEILA DAVIS

To control access costs, maintain order on their networks and make sure their company is getting the best information, IS managers increasingly are thrust into the role of administrators of external on-line information services, as those services are requested by everyone from chief executives to financial analysts to secretaries.

"We are responsible for maintaining the information structure—the hardware and disks, the software, the PCs, the mainframes and the LANs. So we want to make sure that if a user is going to access an on-line data base, it works as smoothly as we would want our in-house access to work," says Chester Romaniak, vice president of IS for Teleglobe Canada Inc., the huge Montreal-based communications carrier.

"I'm not sure if we will ever take over the management of on-line data bases completely, but access must be controlled," Romaniak adds. "Just as the company doesn't give long-distance dialing capability to everyone, it shouldn't give dial-up access to everyone."

Other IS managers have reported an increase in requests for on-line services that are different from the simple hook-ups requested a few years ago. Frequently, they say, the user knows the kind of information he or she wants, but no longer has a specific data base service in mind. It is falling more and more to the IS staff to do that research.

Exploring the Options

"We are a lot more involved in on-line services than we were two years ago," says an IS executive at a major securities firm who asked that his name not be used. "There is an increased need from users and increased business requirements. When the user has a need for outside data, it is up to IS to explore the options."

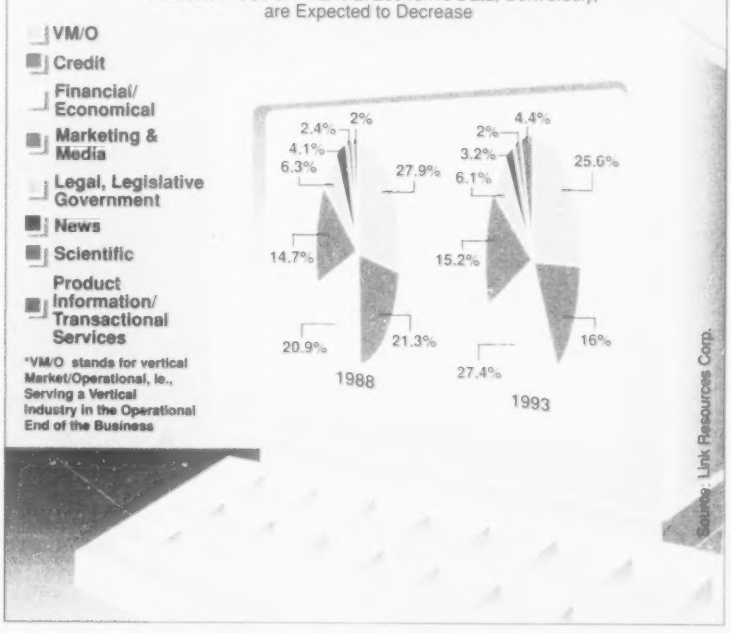
"We work with the user to make the selection. We would point out the technical issues—any technical shortcomings that the nontechnical person would not observe," the securities executive adds. "We look to the vendor to provide user training, but we also make sure that one IS person goes through the training for each on-line service [purchased]. That way, there is always someone in IS who knows the service, can address technical questions to the vendor and can answer user questions if there are problems."

At Central and Southwest Services Inc., an electric and gas utilities company based in Dallas, IS also serves as a clearinghouse for on-line services requests. "We don't decide on the value of the need, but our job is to go about bringing that service into the company. We identify what data bases are available, the user chooses one and we make it happen," says Dick Groff, manager of EIS planning at the utilities company.

"On-line data base services have to come under IS for any number of reasons," says Steven Sieck, vice president

The Information IS Manages

Electronic Information Market Share Projections for 1993 Show Fairly Substatial Incerases in Use of Financial/Economic Data, Conversely, are Expected to Decrease



of electronic services at LINK Resources Corp., a New York City-based on-line services market research firm. "A lot of external information is most valuable when combined with internal information; for example, incorporating external and internal data on one graph. The more external information is integrated into the internal information sources, the more valuable it becomes. Obviously, IS must implement the tools to enable this."

Some companies' libraries still administer on-line services, but with increasing support from IS. At Marriott Corp., based in Washington, D.C., the legal department heavily uses the services of Dayton, Ohio-based Mead Data Central Inc.'s Lexis and Nexis on-line data bases.

For five years, these services were accessible only through a dedicated Mead terminal in the law library, according to library information specialist Elizabeth Wetzel. But two years ago, with the help of Marriott's IS staff and Mead, lawyers, paralegals and administrative staff gained access to Lexis and Nexis through the Wang Laboratories Inc. terminals on their desks. The new setup provides the lawyers with information on case precedents, and provides them with a data base of U.S. state and international laws that would take up too much room in the library in book form.

To avoid overloading the already-stretched legal department network, IS has limited access to no more than three Wang users at any time. The fourth user receives an "access denied" message and can try again later or go to the library.

"Mead came to us with the option of providing access to our Wang systems, and IS installed the Mead software. Our systems people had to modify the software somewhat to accommodate our terminals," says Wetzel. "Then the systems people came up with a set of instructions for the attorneys on how to access the data bases from the Wang computers. Mead did not have any written documentation for the systems, but it did provide the initial training."

Wetzel says members of the systems staff attended the Mead training and are available for emergency questions on access and on problems related to the Wang computers. The library remains responsible for training new users, and billing for the data bases comes to the library.

☐ **COORDINATING ON-LINE ACCESS CAN PROVIDE A COMPANY WITH VOLUME DISCOUNTS.**

IS Can Get Discounts

As for costs, LINK Resources' Sieck points out that as individual PC users accessing numerous data bases proliferate without corporatewide coordination, companies lose opportunities for volume discounts. "The information squires really want to have one point of contact within a company. They don't want to sell information by the drink," he says.

"Coordinating the on-line accesses within a company provides the economic incentives to allow the broadest use," says Sieck. "This doesn't limit users' ability to get the information they need, it enhances it."

Fred Holahan, director of in-house computing products at Interactive Data Corp., a Lexington, Mass., subsidiary of Dun & Bradstreet Corp., agrees. "In brokerage houses, when the individual was procuring services himself, he had no leverage, no discounts for volume. Coordinating access through a company allows IS to use the corporate budget much more wisely," he says.

Indeed, Teleglobe Canada's Romaniak says IS monitors the use of the on-line services to "evaluate the value we are getting. This way, we can see what we are spending. When we look at the bills, the executives can decide clearly if Dow Jones or any other service is worth what they are paying." Cost control and the appropriate distribution of information are two of Romaniak's main concerns in monitoring on-line services, since the firm has almost as many PCs as it has people. "By the end of next year, we will have achieved almost a one-to-one ratio."

Romaniak also has more immediate technical reasons for taking on some responsibility for incoming on-line data bases. "If you have a lot of users unfamiliar with the on-line procedures sitting at PCs, looking through their instruction books while on line, trying to figure out slash commands, you are very susceptible to system errors. That user can run up a big access bill, freeze his PC and cause problems on the network."

Building Front-End Access

Romaniak's solution is one being implemented by many IS managers faced with the same problem: front-end software interfaces that make access to on-line services much easier for the nontechnical user. Implementing these tools requires the expertise of IS departments, but can make administering on-line access easier on IS in the long run.

At Teleglobe, eight top managers use a Comshare Inc. executive information system (EIS), and four more are expected to use it within two months. Romaniak's department is developing an EIS specifically on business operations and will eventually develop one for marketing, as well. The firm started out with COMPAQ Computer Corp. 386 PCs and has a few of those in use, but has standardized on the IBM-compatible Packard Bell Co. 386 PCs.

The existing corporate EIS, based on Comshare's Commander EIS software,

Why IS Has Become the Gateway

Steven Sieck of LINK Resources Corp., a New York City-based on-line services market research firm, sees three reasons why on-line services are coming under the supervision of IS managers.

For one thing, he says, "The proliferation of PC LANs means more end users work together, so it is now possible and desirable to leverage the investment in outside services—and in hardware—across those networks."

The second reason is the emergence of the general business user, he adds. Specialty data bases have proliferated and on-line services directories are as thick as dictionaries—and most new users of on-line services are nonspecialists.

Sieck points out that Dow Jones & Co. Inc. of New York City, in its recent annual report, cites a boom in the use of its on-line news service by corporate executives. In the past, such services were more frequently used by librarians or secretaries, and the news items were passed on to the executive in hard copy. With more PCs in use by top management and executive information systems (EISs) becoming more prevalent executives are going on line themselves.

The third factor Sieck cites is the changing information marketplace. Big communications companies looking for other value-added markets are discovering on-line services as new revenue outlets. Sieck predicts regional telephone operating companies will soon be forming partnerships with large on-line vendors to get a foot in the door.

delivers the Dow Jones on-line news service to Teleglobe executives via a set of interfaces readily understood by non-technical users. Comshare of Ann Arbor, Mich., already had a Dow Jones interface in place when the firm began using Commander.

"We can customize windows, depending on the type of news the executive wants—if he is just interested in specific companies, if he wants more or less detail," says Romaniak. "It makes on-line access very convenient. The executives are comfortable using it [Commander EIS] to access the data base, and it eliminates problems on our system when the user is not familiar with data base commands. The entire EIS takes about 15 minutes of training time for the executive."

A number of Teleglobe's executives have requested Infoglobe, a Canadian on-line news service. Romaniak and Infoglobe are in the process of developing an interface for the service that will be as easy to access as Comshare's Dow Jones interface.

"We have had other requests to add other on-line services too, and we will get to those as soon as we can. Right now, we are concentrating on implementing the rest of the EIS, function by function," Romaniak says. "Our legal department needs direct access to legal data bases—going through the library is too cumbersome for them—so we are considering putting them up on a system. We are getting a lot of requests at the managerial level for more on-line services."

Central and Southwest's top executives also requested more direct, and easy, access to news and stock information that their secretaries had been obtaining for them from The Source of McLean, Va. Groff chose to incorporate the request into an EIS called Easel, from Interactive Images Inc. of Woburn, Mass. Easel has a graphics interface specifically for Dow Jones, called Stockwatch, which provides the executives with the type of access they need.

No CEO Training Time

"You don't get a lot of training time with a CEO, and since we are getting more requests from executives, we are going more toward front-end software tools so they can use the on-line services themselves," says Groff. Right now, the company's top executives use Compaq 386s on a network, using Oracle's data base management system locally and the Easel EIS. Eventually, the system will link to the corporate data base on an Amdahl Corp. mainframe, also running the Oracle data base.

Easel will allow the executives to compare stock information from Dow Jones with in-house performance figures and create graphics incorporating both internal and external data, says Groff. He expects many more requests for this type of service in the future.

These requests add to the general clamor for IS services, and they frequently take priority over other requests—for critical business reasons. However, the time it takes to act on such a request depends on the scope of the request and type of data base needed, say IS managers.

> ☐ **THE MORE A PIECE OF INFORMATION IS SHARED AMONG DIFFERENT USERS, THE MORE VALUABLE IT IS.**

One of those critical business needs is using on-line data as a quality control measure for internal data. In the financial services industry, this practice has increased since the stock market nosedive of 1987, according to Holahan at Interactive Data.

The unnamed securities firm mentioned above receives five different on-line services, including Datasheet, a data base of pricing and financial data on publicly traded securities offered by Interactive Data. "We use Datasheet to provide corporate action information and foreign security pricing for those involved in the global custodianship of clients' securities," says the IS executive there.

Services Support Company Data

"The Datasheet data is used to support in-house data as a quality check; it is a second source to validate in-house information," says the executive. The hardware and software varies throughout the firm, he notes, but most users work on IBM-compatible PCs in a DOS environment.

"Before the [1987 stock market] crash, a lot of users at brokerage houses had their own PCs and their own budgets and their own individually procured on-line services. The individuals had more latitude before the crash, so they sourced their own analysis tools," says Holahan. "There was no method of standardization, no method in place to defend the investment decisions being made. One person was using one set of analysis tools, and the next person was using a whole different set.

"Management woke up after the crash and saw that standards were needed to make investment decisions. Many brokerage houses have begun to standardize through IS on the on-line services they use for investment analysis," Holahan says.

LINK's Sieck notes a move toward standardization of internal and external data in other industries, as well. "The more the same piece of information is shared among different users, the more valuable it is. This is the role that information can play in maintaining organizational learning on a consistent basis," he says.

The trend toward greater IS control of access to on-line information services is converging with a trend among vendors to become merely suppliers of raw data to their customers.

"Users are beginning to want more control over the data they access. The future trend is for data base vendors and other new information providers to broadcast the raw data to the corporate site to be filtered and organized according to the needs of the organization, rather than being maintained and organized off site," says Sieck.

Interactive Data has developed one such on-line service. Called MarketPlus, the service incorporates a wide variety of global capital-markets data for financial services firms. MarketPlus consists of data, applications and a data base management system. The information is updated as an off-site data base would be, but instead of residing at the vendor location with dial-up access, the data are sent to the user's IBM or Digital host computer for distribution and are updated remotely by the vendor.

"This was created because we saw more involvement by IS. In fact, IS departments were asking us to create it," says Holahan. "They said PCs have run amok, and they see the need to manage both the hardware and the information for it most effectively."

Sieck cites Dow Jones as another example. Dow Jones has announced a network architecture called Dowvision, which will be used to broadcast data to a corporate site in a raw form.

Sending raw on-line data to a customer site could create new opportunities for vendors to assist in packaging that data for various applications, Sieck says. No matter which company or user organization fills that user need, he adds, "One thing is clear. It has to go through IS." ▭

Leila Davis is a freelance writer based in Alexandria, Va.